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INTRODUCTION

17.1 This chapter provides an overview of the survey methodology used in ABS household surveys. It should be used in conjunction with Chapter 16, which provides a broad overview of ABS survey methodology, and Chapters 18-22 which provide more detail on aspects of survey design that are particular to specific labour-related household collections.

SCOPE AND COVERAGE

17.2 The scope of ABS household surveys varies from survey to survey. The Census of Population and Housing has the broadest scope of all ABS household surveys and aims to collect information from almost all persons residing in Australia on census night. The Labour Force Survey aims to collect information from a sample of the civilian population aged 15 years and over. The target population of the Labour Force Supplementary Surveys varies across surveys and is generally narrower than that of the Labour Force Survey. The target population of the Special Social Surveys also varies.

17.3 Practical collection difficulties, low levels of response and the small numbers involved have resulted in the exclusion of persons living in private dwellings in remote and sparsely settled parts of Australia from a number of household surveys (exceptions include: the Census of Population and Housing; the Labour Force Survey; and Special Social Surveys whose target population includes persons living in remote and sparsely settled areas). The exclusion of these persons has only a minor impact on any estimates produced for individual States and Territories, with the exception of the Northern Territory, where such persons account for over 20% of the population.

17.4 Some household surveys exclude all persons living in special dwellings from their scope (certain Special Social Surveys). Others exclude certain types of persons living in special dwellings: for example, institutionalised persons¹ and boarding school pupils² are excluded from the scope of most supplementary surveys.

1. Institutions are defined as: hospitals and homes (including general homes, other hospitals, convalescent homes, homes for the aged, retirement homes, homes for the handicapped and orphanages), and prisons. Institutionalised persons are defined as all persons selected in institutions, apart from live-in staff who do not usually live in a private dwelling.

2. Boarding school pupils are defined as all pupils selected in boarding schools.

17.5 Coverage rules are generally applied in all household surveys to ensure that each person is associated with only one dwelling, and hence has only one chance of selection. The chance of a person being enumerated at two separate dwellings in the one survey is considered to be negligible.

COLLECTION METHODOLOGY

17.6 A number of collection methods are used in household surveys, and many surveys use more than one method. The most common method used is interview. Telephone, face-to-face, personal, Any Responsible Adult (ARA) and computer assisted interview are all used in household surveys. Telephone interview is used extensively in the Labour Force Survey and the supplementary surveys; face-to-face interviewing is used extensively in the Special Social Surveys. Personal interviewing is generally used in Special Social Surveys, while ARA interviewing is generally used in the Labour Force Survey and supplementary surveys. Computer assisted interviewing is used in a number of Special Social Surveys. Self-enumeration and administrative data sources are also used, particularly to collect sensitive data or to supplement the data collected by interview. Refer to Chapter 16 for further explanation of different collection methods.

17.7 Intensive follow up procedures for non-response are in place for household surveys. For both face-to-face interviews and telephone interviews, interviewers make a number of attempts to contact households at different times of the day and on different days during the week. For providers unable to be contacted by telephone, a face-to-face visit is attempted. If the provider can still not be contacted within the survey period after repeated attempts, and the dwelling has been verified as not vacant, the dwelling is listed as a non-contact.

SAMPLE DESIGN

17.8 With the exception of the Census of Population and Housing, most ABS household surveys use probability sample designs, drawing their sample from the **Population Survey Master Sample**. The Population Survey Master Sample is drawn from the **Population Survey Framework**. It is designed to meet the needs of the various types of ABS household surveys including the Labour Force Survey and its supplementary topics, as well as the Special Social Surveys.

POPULATION SURVEY FRAMEWORK

17.9 The Population Survey Framework is composed of two components: the private dwelling framework and the special dwelling framework. These two frames enable the selection of samples that represent the Australian population.

Private dwelling framework

17.10 The private dwelling framework is a list of all census collection districts (CDs) in Australia. There are approximately 34,000 CDs on the framework, with most CDs containing around 250 private dwellings. For most areas, CDs are also the Primary Sampling Units (PSUs) used in sample selection for the Population Survey Master Sample. However in areas with low population density (where CDs contain smaller numbers of private dwellings), PSUs are instead formed by grouping (or pooling) neighbouring CDs. There are some 30,000 PSUs on the framework. Samples of private dwellings for use in household surveys are obtained by selecting a sample of PSUs, then selecting a sample of dwellings within those PSUs. By identifying households in dwellings³, and persons within households, a sample of persons in private dwellings is obtained.

3. Note there may be more than one household associated with a dwelling.

Special dwelling framework

17.11 The special dwelling framework is a list of 'special' dwellings, from which samples of

special dwellings and their residents can be selected. Special dwellings are establishments which provide predominantly short-term accommodation for communal or group living and often provide common eating facilities. They include hotels, motels, hostels, hospitals, religious institutions providing accommodation, educational institutions providing accommodation, prisons, boarding houses, short-stay caravan parks, and Aboriginal and Torres Strait Islander communities. Some special dwellings are designed for a particular purpose (e.g. hospitals) and, as such, provide accommodation for specific groups of people. Special dwellings each comprise a number of dwelling units. Currently there are some 27,000 special dwellings on the frame.

17.12 The framework also contains information about the average occupancy of each special dwelling. Average occupancy is defined as an approximate yearly average of the number of occupants found in a particular special dwelling.

Stratification

17.13 The private dwelling framework and the special dwelling framework are divided (stratified) into groups (strata) with similar characteristics. The stratification used in each framework is described below.

Private dwelling framework

17.14 The PSUs on the private dwelling framework are stratified geographically. Strata are formed by initially dividing Australia into geographic regions within each State/Territory which broadly correspond to Statistical Divisions or Subdivisions. There are approximately 100 regions in the framework. Regions are further subdivided, on the basis of population density, to ultimately form approximately 300 private dwelling strata on the frame.

Special dwelling framework

17.15 The special dwelling framework is also stratified geographically, though at a broader level than the private dwelling framework. In many cases the demographic, social and labour force characteristics of the occupants of special dwellings are not typical of the population residing in private dwellings, and therefore it is necessary to sample special dwellings separately by placing them in separate strata within each geographic (sample design) region. This provides for more effective samples of persons within special dwellings and private dwellings, and the flexibility to select some samples which exclude all or some special dwellings, or to select samples in which special attention is paid to persons residing in particular special dwellings.

POPULATION SURVEY MASTER SAMPLE

17.16 The Population Survey Master Sample comprises a sample of PSUs and special dwellings from the Population Survey Framework. Most household surveys conducted by the ABS use samples drawn from the Population Survey Master Sample.

17.17 To satisfy the varying sampling and collection requirements of the many surveys using the Population Survey Master Sample, the sample has been designed to be as flexible as possible. Although the Labour Force Survey, Special Social Surveys and other ABS household surveys all have separate samples of dwellings, they are all selected from the Population Survey Master Sample using the same procedures. In many cases, much of the field work involved in setting up the sample is common to several surveys.

Sample design

17.18 A multi-stage⁴ area sample design is used to draw the sample of private dwellings from the list of PSUs on the private dwelling framework. For most areas there are three stages of sample selection: the first stage involves the selection of a sample of PSUs (each PSU generally equates to a CD); the second involves the selection of blocks within the selected PSUs; and the third involves the selection of dwellings within the selected blocks. However, for areas with a low population density there are four stages to sample selection: the first stage involves the selection of a sample of PSUs (each PSU is a group of contiguous CDs); the second involves the selection of a sample of CDs from the selected PSUs; the third involves the selection of blocks within the selected CDs; and the fourth involves the selection of dwellings within the selected blocks.

4. Multi-stage sampling is an extension of cluster sampling - see Chapter 16 for further information.

17.19 The use of cluster sampling, ensures that the 'final sampling units', i.e. the dwellings selected in the sample, form groups within which the dwellings are close together. This reduces the cost of compiling dwelling lists, and the amount of interviewer travel between selected dwellings. Highly clustered samples, where a large number of dwellings is selected from each of a small number of small areas, produce the lowest operational costs, but the results are less reliable and less representative of the population at large (i.e. have higher standard errors). A key feature of the design is achieving an acceptable balance between cost and accuracy.

17.20 A multi-stage design is also used to draw the sample of special dwellings from the special dwelling framework. A sample of special dwellings is selected at the first stage and dwelling units (rooms, beds, caravan sites etc.) at the second stage.

Sample allocation

17.21 The allocation of sample between the States is a compromise between accurate national estimates and useable estimates for the smaller States. As a result, the smaller States (and the Territories) have relatively high sampling fractions. The sampling fraction is uniform within States, reflecting the fact that, at the time the methodology was originally devised the State was the smallest geographic area for which estimates were usually published. Some allowance for the higher costs of sampling in non-metropolitan areas is made in the increased clustering of the sample in those areas.

Sample selection

17.22 An adjusted form of **systematic sampling** is used as the selection method for both private and special dwelling samples.

Private dwellings

17.23 As discussed in paragraph 17.18, for most areas there are three stages to sample selection. At the first stage, PSUs are selected systematically with probability proportional to size (in terms of number of dwellings). At the second stage, blocks of 25-50 dwellings are formed and two blocks are selected, again with probability proportional to size. One block is used for the Labour Force Survey sample and the other for a parallel sample. The parallel sample is used for the Special Social Surveys, and for other household surveys where probability based samples are required. At the third stage, all dwellings in the selected blocks are listed and a 'cluster' of dwellings - comprising the final selection units - is selected using systematic random sampling. This process limits the need for a listing of dwellings to only those in the selected blocks.

17.24 For private dwellings, the selection of sample units at each stage (other than the last) results in a probability of selection proportional to the approximate number of dwelling units the CDs or blocks contain. At the last stage, in which dwellings are selected, each dwelling within a selected block has the same chance of selection.

17.25 The sampling fractions and selection procedures result in a self-weighting sample which guarantees every dwelling in the same State or Territory the same chance of selection.

Special dwellings

17.26 A systematic sample of special dwellings is selected from the special dwelling list, with probability proportional to size. An independent sample is selected in each region, with the larger special dwellings selected with certainty. When samples are required with special emphasis on particular regions, it is possible to adjust the special dwelling sample as well as the private dwelling sample within those regions.

17.27 Average occupancy is used as the 'measure of size' of the special dwelling for selection purposes.

Adjusting for growth

17.28 The Population Survey Master Sample is reselected once every five years (see paragraph 17.31), with the sample being used up progressively by ABS household surveys over each intervening five year period. Regular checking of the dwellings listed for each selected block, combined with the use of systematic random sampling at the last stage, ensure that all dwellings have the correct probability of selection for all surveys during the five year period (that is, the sample automatically adjusts for growth).

Growth revision

17.29 For the private dwelling sample, special 'growth revision' procedures are applied in areas where pockets of substantial growth have occurred (e.g. new housing subdivisions). Strata where substantial non-uniform growth has occurred are identified (using building approvals data) and each CD within them is represented twice on the frame, once for the dwellings in the CD as at the last population census and once for the growth dwellings. This means that the growth CDs can be selected twice in the sample. All subsequent stages of selection within all selected growth PSUs are the same as for non-growth PSUs. The possibility of excessive distortion occurring in the sample is almost eliminated by this procedure, resulting in a reduction in sampling variability.

17.30 Lists of special dwellings are updated from Census information, previous lists of special dwellings, local knowledge, commercial and other directories, and field work. Special dwellings not on this list are accounted for in the private dwelling sample.

SAMPLE RESELECTION

17.31 The ABS reselects the Population Survey Master Sample every five years, using preliminary data from the Census of Population and Housing, to ensure that the household survey samples continue to accurately reflect the distribution of the Australian population. As well, the opportunity exists to examine the overall design of individual household surveys to ensure that they remain efficient and cost-effective.

17.32 The use of a constant sampling fraction between sample redesigns for regular surveys such as the Labour Force Survey results in increasing numbers of selections in the sample as the population grows. Also, as more selections are added to the survey, the operational costs increase. To offset these costs, the sampling fraction may be reduced at each redesign. (As standard errors are a function of the sample size rather than the sampling fraction, standard errors will generally not increase with successive redesigns in spite of the decreasing sampling fraction.)

ESTIMATION METHODS

17.33 Household survey estimates are generally calculated using calibration estimation techniques.

BENCHMARKS

17.34 Estimates of the population produced from household surveys are calculated in such a way as to add up to independently estimated counts (benchmarks) of the population. For the Labour Force Survey these benchmarks are based on Census of Population and Housing data, adjusted for under-enumeration and updated for births, deaths, interstate migration, and net permanent and long term migration. Benchmarks have been developed for State/Territory of usual residence, part of State of usual residence (for example, capital city, rest of State), age and sex. Each cross-classification of these benchmark variables is known as a benchmark cell. Revisions are made to benchmarks after each Census of Population and Housing, and when the bases for estimating the population are reviewed.

17.35 Other household surveys use various combinations of benchmark variables to produce benchmark cells. Some surveys use supplementary information (such as Labour Force Survey estimates), referred to in this context as pseudo-benchmarks, to supplement independent demographic benchmarks based on Census of Population and Housing data. Household surveys may use calibration methods to incorporate other auxiliary information on target populations into estimates - for instance benchmarks for the Indigenous population, or the population of private households.

NON-RESPONSE

17.36 For most household surveys, a non-response adjustment is performed implicitly by the estimation system, which effectively imputes for each non-responding person on the basis of all responding persons in the same post-stratum. This adjustment accounts for both full non-response and non-response for individual questions.

RESPONSE RATES

17.37 The **response rate** usually quoted for ABS household surveys is defined as the number of fully responding households divided by the total number of households excluding sample loss. Examples of sample loss for household surveys include: households where all persons are out of scope and/or coverage; vacant dwellings; dwellings under construction; dwellings converted to non-dwellings; derelict dwellings; and demolished dwellings.

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